WHAT IS CLAIMED IS:

1. A surface inspection apparatus comprising:

a light source section for emitting a first luminous flux and a second luminous flux irradiated on the surface of an inspected object;

a first irradiation optical system in which the first luminous flux is irradiated on the surface of an inspected object at a first irradiation angle;

a second irradiation optical system in which the second luminous flux is irradiated on the surface of an inspected object at a second irradiation angle different from the first irradiation angle;

a displacement section for relatively displacing an inspected object and an irradiation luminous flux of the irradiation optical system;

a light receiving optical system for receiving scattered light of the first luminous flux irradiated by the first irradiation optical system and produced from an inspection object on the surface of an inspected object and scattered light of the second luminous flux irradiated by the second irradiation optical system and produced from an inspection object on the surface of an inspected object;

a first light receiving section for converting scattered light of the first luminous flux received by the light receiving optical system into a first light receiving signal;

a second light receiving section for converting scattered light of the second luminous flux received by the light receiving optical system into a second light receiving signal; and

a signal forming section for forming a measuring signal on the basis of the first light receiving signal and the second light receiving signal, characterized in that

the first light receiving section and the second light receiving

section respectively form a first light receiving signal and a second light receiving signal which are different in sensitivity or dynamic range from each other, and

the signal forming section synthesizes the first light receiving signal and the second light receiving signal which are different in sensitivity or dynamic range from each other to form a measuring signal.

2. A surface inspection apparatus according to claim 1, wherein the first characteristic of the first luminous flux emitted by the light source section and the second characteristic of the second flux emitted by the light source section lie in wavelength of luminous flux or polarized-light component.

3. A surface inspection apparatus according to claim 1, wherein a first irradiation angle of the first irradiation optical system is set to be smaller than a second irradiation angle of the second irradiation optical system.

4. A surface inspection apparatus comprising:

a light source section for emitting a luminous flux irradiated on the surface of an inspected object;

an irradiation optical system for irradiating a luminous flux on the surface of an inspected object at a fixed irradiation angle;

a displacement section for relatively displacing an inspected object and an irradiation luminous flux of an irradiation optical system;

a first light receiving optical system for receiving a first scattered light in a first scattering direction irradiated by the irradiation optical system and emitted from an inspection object on the surface of an inspected object;

a second light receiving optical system for receiving a second scattered light in a second scattering direction irradiated by the irradiation optical system and emitted from an inspection object on the surface of an

inspected object;

a first light receiving section for converting the first scattered light received by the first light receiving optical system into a first light receiving signal;

a second light receiving section for converting the second scattered light received by the second light receiving optical system into a second light receiving signal; and

a signal forming section for synthesizing the first light receiving signal and the second light receiving signal to thereby form a measuring signal, characterized in that

the first light receiving section and the second light receiving section respectively form a first light receiving signal and a second light receiving signal which are different in sensitivity or dynamic range from each other, and

the signal forming section synthesizes the first light receiving signal and the second light receiving signal which are different in sensitivity or dynamic range to form a measuring signal.

5. A surface inspection apparatus according to claim 4, wherein a first scattering direction forms a larger angle with respect to the irradiation direction of luminous flux than that of a second scattering direction.

6. A surface inspection apparatus according to claim 4, wherein the signal forming section extracts a foreign matter signal included in the first light receiving signal and a foreign matter signal included in the second light receiving signal, to discriminate that the foreign matter signals included in the fixed range in the respective light receiving signals results from the same foreign matter so that the light receiving signal satisfied with the fixed condition is used preferentially to form a measuring signal.

7. A surface inspection apparatus according to claim 6, wherein the

signal forming section forms foreign matter data by a coordinate when crossing a fixed level and a peak level in the range exceeding the fixed level on the basis of the first light receiving signal or the second light receiving signal.

8. A surface inspection apparatus according to claim 7, wherein the signal forming section forms, where a peak level when the foreign matter signal is detected by the light receiving signal higher in sensitivity out of the first light receiving signal and the second light receiving signal is saturated, foreign matter data on the basis of the light receiving signal lower in sensitivity.

9. A surface inspection apparatus comprising:

a light emitting means for emitting a first luminous flux and a second luminous flux for irradiating on the surface of an inspected object;

a first irradiation means for irradiating the first luminous flux on the surface of an inspected object at a first irradiation angle;

a second irradiation means for irradiating the second luminous flux on the surface of an inspected object at a second irradiation angle different from the first irradiation angle;

a displacement means for relatively displacing an inspected object and irradiation luminous fluxes of the first and second irradiation means;

a light receiving means for receiving scattered light of the first luminous flux irradiated by the first irradiation means and produced from an inspection object on the surface of an inspected object, and scattered light of the second luminous flux irradiated by the second irradiation means and produced from an inspection object on the surface of an inspected object;

a first conversion means for converting scattered light of the first luminous flux received by the light receiving means into a first light receiving signal;

a second conversion means for converting scattered light of the second luminous flux received by the light receiving means into a second light receiving signal; and

a signal forming means for forming a measuring signal on the basis of the first light receiving signal and the second light receiving signal, characterized in that

the first light receiving means and the second light receiving means respectively form a first light receiving signal and a second light receiving signal which are different in sensitivity or dynamic range from each other, and

the signal forming means synthesizes the first light receiving signal and the second light receiving signal which are different in sensitivity or dynamic range from each other to form a measuring signal.

10. A surface inspection apparatus according to claim 9, wherein the first characteristic of the first luminous flux emitted by the first light emitting means and the second characteristic of the second luminous flux emitted by the second light emitting means lie in wavelength of luminous flux or polarized-light component.

11. A surface inspection apparatus according to claim 9, wherein a first irradiation angle of the first irradiation means is set to be smaller than a second irradiation angle of the second irradiation optical system.

12. A surface inspection apparatus comprising:

a light emitting means for emitting a luminous flux for irradiating on the surface of an inspected object;

an irradiating means for irradiating a luminous flux on the surface of an inspected object at a fixed irradiation angle;

a displacement means for relatively displacing an inspected object and an irradiation luminous flux of the irradiation means;

a first light receiving means for receiving a first scattered light in a first scattering direction irradiated by the irradiation means and produced from an inspection object on the surface of an inspected object;

a second light receiving means for receiving a second scattered light in a second scattering direction irradiated by the irradiation means and produced from an inspection object on the surface of an inspected object;

a first conversion means for converting the first scattered light received by the first light receiving means into a first light receiving signal;

a second conversion means for converting the second scattered light received by the second light receiving means into a second light receiving signal; and

a signal forming means for forming a measuring signal by synthesizing the first light receiving signal and the second light receiving signal, characterized in that

the first light receiving section and the second light receiving section respectively form a first light receiving signal and a second light receiving signal which are different in sensitivity or dynamic range from each other, and

the signal forming means forms a measuring signal by synthesizing the first light receiving signal and the second light receiving signal which are different in sensitivity or dynamic range.

13. A surface inspection apparatus according to claim 12, wherein the first scattering direction forms a larger angle with respect to the irradiation direction of luminous flux than that of the second scattering direction.

14. A surface inspection apparatus according to claim 12, wherein the signal forming means extracts a foreign matter signal included in the first light receiving signal and a foreign matter signal included in the second light receiving signal, to discriminate that the foreign matter signals included in

the fixed range in the respective light receiving signals results from the same foreign matter so that the light receiving signal satisfied with the fixed condition is used preferentially to form a measuring signal.

15. A surface inspection apparatus according to claim 14, wherein the signal forming means forms foreign matter data by a coordinate when crossing a fixed level and a peak level in the range exceeding a fixed level on the basis of the first light receiving signal or the second light receiving signal.

16. A surface inspection apparatus according to claim 15, wherein the signal forming means forms, where a peak level is saturated when the foreign matter signal is detected by the light receiving signal of high sensitivity out of the first light receiving signal and the second light receiving signal, foreign matter data on the basis of the light receiving signal of low sensitivity.

17. A surface inspection method including:

a step for emitting a first luminous flux and a second luminous flux for irradiating on the surface of an inspected object;

a step for irradiating the first luminous flux on the surface of an inspected object at a first irradiation angle;

a step for irradiating the second luminous flux on the surface of an inspected object at a second irradiation angle different from the first irradiation angle;

a step for relatively displacing an inspected object and an irradiation luminous flux;

a step for receiving scattered light of the first luminous flux produced from an inspection object on the surface of an inspected object, and scattered light of the second luminous flux produced from an inspection object on the surface of an inspected object;

a step for converting the scattered light of the received first luminous flux into a first light receiving signal;

a step for converting the scattered light of the received second luminous flux into a second light receiving signal; and

a step for forming a measuring signal on the basis of the first light receiving signal and the second light receiving signal, characterized in that

in the conversion step into the first light receiving signal and the conversion step into the second light receiving signal, a first light receiving signal and a second light receiving signal which are different in sensitivity or dynamic range from each other are formed, and

in the signal forming step, the first light receiving signal and the second light receiving signal which are different in sensitivity or dynamic range from each other are synthesized to form a measuring signal.

18. A surface inspection method according to claim 17, wherein the first characteristic of the first luminous flux and the second characteristic of the second luminous flux are a wavelength of luminous flux or a polarized-light component.

19. A surface inspection method according to claim 17, wherein the first irradiation angle in the irradiation step of the first luminous flux is set to be smaller than that of the second irradiation angle in the irradiation step of the second luminous flux.

20. A surface inspection method including:

a step for emitting a luminous flux for irradiating on the surface of an inspected object;

a step for irradiating a luminous flux on the surface of an inspected object at a fixed irradiation angle;

a step for relatively displacing an inspected object and an irradiation luminous flux;

a step for receiving a first scattered light in a first scattering direction produced from an inspection object on the surface of an inspected object;

a step for receiving a second scattered light in a second scattering direction produced from an inspection object on the surface of an inspected object;

a step for converting the received first scattered light into a first light receiving signal; and

a step for converting the received second scattered light into a second light receiving signal; and

a step for forming a measuring signal by synthesizing a first light receiving signal and a second light receiving signal, characterized in that

in the conversion step into the first light receiving signal and the conversion step into the second light receiving signal, a first light receiving signal and a second light receiving signal which are different in sensitivity or dynamic range from each other are formed, and

in the signal forming step, the first light receiving signal and the second light receiving signal which are different in sensitivity or dynamic range from each other are synthesized to form a measuring signal.

21. A surface inspection method according to claim 20, wherein the first scattering direction forms a larger angle with respect to the irradiation direction of luminous flux than that of the second scattering direction.

22. A surface inspection method according to claim 20, wherein in the signal forming step, a foreign matter signal included in the first light receiving signal and a foreign matter signal included in the second light receiving signal are extracted, to discriminate that the foreign matter signals included in the fixed range in the respective light receiving signals results from the same foreign matter so that the light receiving signal

satisfied with the fixed condition is used preferentially to form a measuring signal.

23. A surface inspection method according to claim 22, wherein in the signal forming step, foreign matter data by a coordinate when crossing a fixed level and a peak level in the range exceeding a fixed level is formed on the basis of the first light receiving signal or the second light receiving signal.

24. A surface inspection method according to claim 23, wherein in the signal forming step, foreign matter data is formed on the basis of the light receiving signal of low sensitivity where a peak level is saturated when the foreign matter signal is detected by the light receiving signal of high sensitivity out of the first light receiving signal and the second light receiving signal.